REMARKS

Claims 1-17 are all the claims pending in the application. Claims 1-17 presently stand rejected.

Claims 1-8, 16 and 17 are rejected under 35 U.S.C. § 102(b) as being anticipated by *newly cited* Umemura et al. (5,523,058).

Claims 9 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Umemura et al. (5,523,058) in view of Suzuki et al. (5,553,618).

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Umemura et al. (5,523,058) in view of Suzuki (5,553,618), and further in view of Drukarev et al. (5,105,814).

Claims 12-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Umemura et al. (5,523,058) in view of Suzuki (5,553,618) and Drukarev et al. (5,105,814), and further in view of Ebbini et al. (2003/0212326).

Analysis

Claims 1 and 17 are the only claims in independent form; therefore, the following discussion is initially directed to these independent claims.

Claim 1 is directed to an ultrasonic transmitting and receiving apparatus which includes, referring to FIG. 1, an ultrasonic transducer array 10, drive signal generating means 14, transmission control means 13 for controlling the drive signal generating means to form at least one ultrasonic beam, and a signal processing means 21 for performing reception focusing processing on plural detection signals obtained based on ultrasonic echoes received by the plural ultrasonic transducer so as to form a reception focal point in at least one region within the object to be inspected, thereby obtaining plural detection signals relating to the at least one region. In

addition, claim 1 provides **storage means 31 for storing plural different acoustic pressure intensity profiles**, each of which represents one of acoustic pressure intensity and acoustic pressure intensity ratios in plural regions included in an isochronal surface as a surface where ultrasonic beams reach in predetermined time elapsed from being transmitted. Claim 1 further includes a calculating means 32 for calculating image data relating to the at least one region on the basis of the plural detection signals related to the at least one region and a selected at least one of the plural different acoustic pressure intensity profiles.

The **acoustic pressure intensity profiles** represent acoustic pressure intensity or acoustic pressure intensity ratios in plural regions included in a surface where the ultrasonic beams reach in a predetermined time elapsed from being transmitted (see specification at page 15). Such surfaces are referred to as "isochronal surfaces". The intensity profiles are expressed by (1) the function of the position (directions) of the plural regions included in the isochronal surface and (2) the acoustic pressure intensity or acoustic pressure intensity ratios therein.

The plural acoustic pressure intensity profiles are set based on the various factors discussed on page 16 of the specification, including: (1) the transmitting directions of the ultrasonic beams, (2) the reception focusing processing of the ultrasonic echoes, specifically receiving directions and depth of the reception focal points, (3) a number of elements used from among the elements included in the ultrasonic transducer array 10, (4) an element pitch, (5) an aperture diameter of the used elements, or (6) aperture conditions including a wait factor within the aperture. The acoustic pressure intensity profile is obtained by simulating an acoustic field based on these aperture conditions, transmission conditions including the transmission delay pattern, and reception conditions including the reception delay pattern. Alternatively, the

acoustic pressure intensity profile may be obtained by transmitting and receiving ultrasonic beams to the scattering phantom based on these conditions and using intensity ratios of ultrasonic echoes obtained by the measurement.

Claim 1 has been amended to clearly state that each of the plural different acoustic pressure intensity profiles represents one of acoustic pressure intensity and acoustic pressure intensity ratios in plural regions included in an isochronal surface as a surface where ultrasonic beams reach in predetermined time elapsed from being transmitted.

The calculating means selects a profile from the plural profiles stored in the intensity profile storage unit 31 based on the transmitting direction and receiving direction set in the scanning control unit 11 and calculates image data with the suppressed side load components (essential data) based on the profile and measurement data corresponding to a selected isochronal surface from among sound data stored in storage unit 25.

In the rejection of claim 1 based on Umemura, there is no discussion regarding the storage means for storing acoustic pressure intensity profiles. There is merely a paraphrase of the claimed acoustic pressure intensity profiles in relation to the calculating means on page 3, line 5 of the Office Action, which appears to rely on cols. 6, 8 and 9 of Umemura for this feature.

Umemura is directed to an ultrasonic therapeutic and diagnostic apparatus which uses an ultrasound waveform of a fundamental frequency and a second harmonic waveform to form an ultrasonic echo image. The Examiner appears to point to the "acoustic pressure waveforms" that are obtained when the phase relation is set such that an ultrasound waveform p1 of a fundamental frequency f is represented by sin ($2\pi ft$) with respect to time t and a second harmonic waveform p2 is approximated by $-\sin(4\pi ft)$, demonstrating an example in which the fall of a synthesized

acoustic pressure is steeper than the rise thereof to act on the generation of acoustic cavitation very advantageously. However, these acoustic pressure waveforms do not correspond to the claimed acoustic pressure intensity profiles described above. At the least, in the claimed invention the intensity profiles represent acoustic pressure intensity or acoustic pressure intensity ratios based upon an isochronal surface. There is no teaching or suggestion in Umemura that an isochronal surface is important or even relevant to the waveforms.

Thus, nothing in Umemura teaches or suggests (1) **storage means for storing acoustic pressure intensity profiles** and (2) **calculating means for calculating image data relating to at least one region of the basis of the plural detection signals relating to the at least one region and the selected at least one of plural different acoustic pressure intensity profiles**.

Still further, with respect to claim 17, none of the features in step (c) are found in Umemura for similar reasons to those mentioned above.

In view of the foregoing, Umemura fails to disclose the recited storage means for storing acoustic pressure intensity profiles and calculating means of the present invention, and thus, fails to anticipate claims 1 and 17.

The remaining rejections are directed to the dependent claims. These claims are patentable by virtue of their dependency from the independent claims.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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